

Appl. No. 10/676,411
Amdt. Dated December 8, 2006
Reply to Office Action of September 13, 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (previously presented) A method comprising:
forming a resist including a baseline material added by a highly absorbing material selected from fluorine (F), tin (Sn), bismuth (Bi), cesium (Cs), antimony (Sb), a fluoropolymer, a metallocene polymer, an alkoxide chelate polymer, and a carboxylate chelate polymer;
thinning the resist to a pre-determined thickness used as an imaging layer; and
improving efficiency of a photoactive acid generator (PAG) to capture secondary electrons produced by an ionizing radiation in the resist.
2. (previously presented) The method of claim 1 wherein forming the resist comprises:
forming the resist using the baseline material being polyhydroxystyrene.
3. (previously presented) The method of claim 1 wherein forming the resist comprises:
adding a percentage in volume at least one of the fluorine (F), tin (Sn), bismuth (Bi), cesium (Cs), and antimony (Sb) into the baseline material, the percentage ranging from 10% to 20%.
4. (previously presented) The method of claim 1 wherein forming the resist comprises:
adding a percentage in volume at least one of the fluoropolymer, the metallocene polymer, the alkoxide chelate polymer, and the carboxylate chelate polymer, the percentage ranging from 10% to 20%.
5. (original) The method of claim 1 wherein thinning comprises:
thinning the resist to a thickness below 100 nm.
6. (original) The method of claim 1 wherein improving comprises:

Appl. No. 10/676,411
Amdt. Dated December 8, 2006
Reply to Office Action of September 13, 2006

increasing a PAG concentration in the resist.

7. (original) The method of claim 1 wherein improving comprises:
controlling moieties proximal to a cleavable bond in the PAG.

8. (original) The method of claim 1 further comprising:
exposing the resist with a radiation being one of an extreme ultraviolet (EUV), X-ray,
electron beam, and ion beam.

9. (previously presented) A method comprising:
forming an imaging layer from a resist made of a baseline material added by a highly
absorbing material selected from fluorine (F), tin (Sn), bismuth (Bi), cesium (Cs), antimony (Sb),
a fluoropolymer, a metallocene polymer, an alkoxide chelate polymer, and a carboxylate chelate
polymer, the layer being thinned to a pre-determined thickness, the layer having improved
efficiency of a photoactive acid generator (PAG) to capture secondary electrons produced by an
ionizing radiation; and
forming an etch resistant layer below the imaging layer for pattern transfer from the
imaging layer.

10. (previously presented) The method of claim 9 wherein the baseline material is
polyhydroxystyrene.

11. (previously presented) The method of claim 9 wherein forming the imaging layer
comprises:
adding to the baseline material by a percentage in volume at least one of the fluorine (F),
tin (Sn), bismuth (Bi), cesium (Cs), and antimony (Sb), the percentage ranging from 10% to
20%.

12. (previously presented) The method of claim 9 wherein forming the imaging layer
comprises adding to the baseline material by a percentage in volume at least one of the
fluoropolymer, the metallocene polymer, the alkoxide chelate polymer, and the
carboxylate chelate polymer, the percentage ranging from 10% to 20%.

Appl. No. 10/676,411
Amdt. Dated December 8, 2006
Reply to Office Action of September 13, 2006

13. (original) The method of claim 9 wherein the thickness is below 100 nm.
14. (original) The method of claim 9 wherein the imaging layer has an increased PAG concentration.
15. (original) The method of claim 9 wherein the imaging layer has controlled moieties proximal to a cleavable bond in the PAG.
16. (original) The method of claim 11 further comprising:
exposing the imaging layer to a radiation being one of an extreme ultraviolet (EUV), X-ray, electron beam, and ion beam.
17. (previously presented) A device comprising:
an imaging layer made of a baseline material added by a highly absorbing material selected from fluorine (F), tin (Sn), bismuth (Bi), cesium (Cs), antimony (Sb), a fluoropolymer, a metallocene polymer, an alkoxide chelate polymer, and a carboxylate chelate polymer, the layer being thinned to a pre-determined thickness, the layer having improved efficiency of a photoactive acid generator (PAG) to capture secondary electrons produced by an ionizing radiation; and
an etch resistant layer below the imaging layer for pattern transfer from the imaging layer.
18. (previously presented) The device of claim 17 wherein the baseline material is polyhydroxystyrene.
19. (previously presented) The device of claim 17 wherein the imaging layer comprises:
a percentage in volume of at least one of the fluorine (F), tin (Sn), bismuth (Bi), cesium (Cs), and antimony (Sb), the percentage ranging from 10% to 20%.
20. (currently amended) The device of claim 17 wherein the imaging layer comprises a percentage in volume of at least one of a fluoropolymer, a metallocene polymer, an alkoxide chelate polymer, and a carboxylate chelate polymer, the percentage ranging from 10% to 20%.

Appl. No. 10/676,411
Amdt. Dated December 8, 2006
Reply to Office Action of September 13, 2006

21. (original) The device of claim 11 wherein the thickness is below 100 nm.
22. (original) The device of claim 11 wherein the imaging layer has an increased PAG concentration.
23. (original) The device of claim 11 wherein the imaging layer has controlled moieties proximal to a cleavable bond in the PAG.
24. (original) The device of claim 18 wherein the imaging layer is exposed with the radiation being one of an extreme ultraviolet (EUV), X-ray, electron beam, and ion beam.
25. (new) The method of claim 1 wherein the thickness is balanced with dosage of radiation exposure to have an overall transmission of approximately 50%.
26. (new) The method of claim 9 wherein the thickness is balanced with dosage of radiation exposure to have an overall transmission of approximately 50%.
27. (new) The device of claim 17 wherein the thickness is balanced with dosage of radiation exposure to have an overall transmission of approximately 50%.